

# NATIONAL KARNAL BUNT SURVEY OF WHEAT GRAIN 2006

Prepared by  
Vedpal Singh Malik, Ph.D.  
Invasive Species and Pest Management  
Unit 134, USDA, APHIS, PPQ  
4700 River Road Riverdale, MD 20737  
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**Background:**

The National Karnal Bunt Survey was started in 1996 in response to the detection of Karnal bunt disease in the United States. Since then this survey has provided invaluable information in the form of negative occurrence data to support the export of U.S. wheat to all foreign markets. In FY-2002, USDA, APHIS, PPQ explored new survey, detection, and analysis technologies and revised the survey protocols and techniques to take advantage of these advances. PPQ continues to explore new technologies and make changes to future survey protocols as the new technologies become available.

**Purpose:**

The sole purpose of the national survey is to provide U.S. certifying officials the ability to issue phytosanitary certificates required by any and all countries to which we export (or may export) wheat.

**National Survey Areas:**

The national survey will be conducted in those areas of the United States where Karnal bunt has not been previously detected.

**Eastern Region:** New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, West Virginia, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, North Carolina, Kentucky, Mississippi, Tennessee, South Carolina, Alabama, Georgia, and Florida.

**Western Region:** Washington, Nevada, Oregon, Idaho, Utah, Montana, Wyoming, Colorado, New Mexico, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Louisiana, Arkansas, Missouri, Iowa, and parts of California, Arizona, and Texas.

**Crops to be surveyed:**

Wheat, durum wheat, and triticale from producing counties not sampled during the 2005 harvest year and where Karnal bunt has not been previously detected.

**Grain Samples – Protocols:**

The survey will collect representative samples from counties where susceptible host crops are produced according to statistics provided by USDA, National Agricultural Statistics Service (NASS). The number of samples will be based on the average production of each host for a 5-year period (2001-2005). This information may be obtained by using the NASS website ([www.nass.usda.gov/](http://www.nass.usda.gov/)). From the home page, under Quick Stats select Crops in the State and County Data section and click Go. It will take you to the U.S. & All States County Data page. In Step 1 select 'Wheat All'. In Step 2 select 'All Practices'. In Step 3 select years From 2001 and To 2005. In Primary Locations select your state and in Secondary Locations select 'All Counties' click Add to select All Counties, then click Get Data. The data should be downloaded onto a disk because of the volume on information produced. The survey does not intend to sample every local elevator. It is an attempt to represent crop production within all production areas. Aggregation point samples provide the best representation of local crop conditions.

The official composite sample size for the bunted kernel analysis is 4 pounds. An additional 250 gram sample should be taken and retained by the state as a reference sample. Samples should be submitted and sealed in sturdy paper bags, or double bagged if not sturdy. This additional sample may be stored in a Nalgene bottle, that has been provided, or any other appropriate container. Once the 4-pound composite sample has been determined free of Karnal bunt, the 250 gram reference sample may be disposed of by the state. If a bunted kernel is found in the 4-pound composite sample, the 250 gram reference sample will be held for additional analysis in instances when the integrity of the original analysis is challenged. When the original positive determination is accepted by the parties involved, the 250 gram reference sample may be disposed of.

If a county has more than one county/local elevator, choose elevators to sample that best represent the entire county. Though each elevator may not receive host material from the entire county, pick those that best represent the county.

If a county is represented in the NASS data but has no county elevator, samples should be taken from the elevators to which the grain is shipped. This may require samples be taken from elevators in adjacent counties or even adjoining states.

Each elevator normally takes a moisture and/or quality sample from each load arriving at the elevator. If arrangements can be made with the elevator to save all or a portion of these samples by placing them in a barrel, national survey samples may be taken when each barrel approaches capacity. This will represent a sampling of all wheat coming into the elevator. Once national survey samples have been taken, the barrels may be emptied. The objective is to take a 4-pound sample that represents all the wheat in the barrel. This can be done either using a small grain probe or using a disposable plastic cup to dip grain from several locations within the barrel. The probe should be cleaned using an alcohol wipe after the wheat in the barrel has been sampled and a new cup and gloves should be used for each new sample.

If the barrel sample method cannot be used, run the wheat out of one or more grain bins and use disposable 16-oz plastic cups to collect grain from the belt until a 4-pound sample has been collected. Mechanical samplers (diverters) should be used if available for collecting samples from a belt.

The State Karnal Bunt Coordinator will create a list of all elevators to be surveyed in a state with the contact person identified for each location and keep it as a file. At least once during the sampling season, a PPQ representative should visit each elevator participating in survey sampling. The purpose of the visit is to observe the sampling process and to provide information and answer questions concerning the program.

#### **National Survey Sampling – Timing:**

The ideal time to sample grain for Karnal bunt is immediately after wheat harvest, however, grain samples may be collected at any time. An important element to remember when evaluating the timing of sample collection is that the longer after harvest the samples are collected and analyzed the greater the chance of having to regulate a much larger area if a sample comes up positive, due to grain movement which may have already occurred. Samples can be taken from local elevators before the harvest is complete if the sample taken is representative of the county in which it was taken and meets the minimum requirements in sampling protocol.

#### **National Survey Sampling – Intensity:**

During the 2006 wheat harvesting year, samples will be collected in parallel with the wheat harvest and in proportion to wheat production from producing counties not sampled during the 2005 harvest year and where Karnal bunt has not been detected.

The minimum sampling requirement is one 4-pound sample from a selected county with 1,000,000 bushels of production. A 4-pound sample should be taken for every 1,000,000 bushels of production. Each 4-pound sample will represent approximately 1,000,000 bushels of host crop. Samples will be collected at points of aggregation near their production areas (local elevators).

A sample will consist entirely of one species; grain of different susceptible species should not be mixed. To the extent possible, samples should be composites of grain from a production area not larger than a county and each sample should contain grain from a single county. To insure a good representative sample, subsamples, which are represented in the composite sample, should represent at least 10 different producers whenever possible.

When there are several counties within a state where each produces less than 1,000,000 bushels of host crop, the state may want to take samples from each county and combine them into a 4-pound composite sample. If this is done, a 250 gram reserve sample from each county should be held by the state. Once the 4-pound composite sample has been determined free of Karnal bunt, the 250 gram reference samples may be disposed of by the state. If a multi-county composite sample is positive for Karnal bunt, the individual county reference samples will be tested to help determine which county produced the bunted kernel.

Another sampling method that may be used is collecting samples from the storage or transfer bins at county elevators. ***This is not a preferred method as it is much harder to establish the identity of growers represented.*** If samples are to be collected in this manner then samples of

host material should be taken from each accessible bin in the elevator. The collector should ask the elevator to run grain onto the belt for a short time and then take a sample of grain from the belt (or any other accessible point). Each bin would represent a composite sample, all bin samples would then be combined, mixed and the official composite 4-pound sample taken.

### **National Survey Sampling – Packaging and Shipping:**

Grain samples should be placed in a new heavy-duty kraft paper bag, as provided. The top of the bag should be rolled down to squeeze out as much air as possible, then the bag stapled shut. Each sample should then be placed in a plastic bag along with a completed copy of the attached information sheet (See Appendix B) and the plastic bag sealed.

Six to eight samples should be packaged in a box for shipping to below address for analysis:

USDA, APHIS, PPQ  
Karnal Bunt Project  
220 East Main Street  
Olney, TX 76374

Samples should be shipped within 48 hours of being collected via overnight carrier.

Other laboratories may request APHIS approval for screening survey samples and KB analysis. If additional laboratories are approved by APHIS, Appendix D will be updated and regional Coordinators notified. Beginning with the FY-2004 survey, PPQ will no longer provide resources to states for processing samples, except for those states with regulated areas. PPQ will continue to approve laboratories, but not fund their operation.

An account has been established with United Parcel Service (UPS) for use by cooperators and federal personnel when shipping National Karnal Bunt Survey samples for analysis. The primary administrative contact, for obtaining specific information concerning use of the account, is Ms. Jennifer Pace. Alternate contacts are: Mr. George Nash or Ms. Linda Stokes. They can be contacted by phone at (940) 564-4192 or fax at (940) 564-4180

### **Sample Analysis:**

National survey samples submitted to Olney, TX will be analyzed using an optical sorter. The application of this technology has been developed by the USDA ARS. The high speed optical sorter will remove suspect bunted kernels from samples. The optical sorter can process a 4-pound sample in less than a minute and typically will reduce the number of kernels that need to be examined to about 8% of the original sample. This reduction allows the staff to focus time and attention on truly potential positives, rather than the time consuming initial sorting process. The suspect kernels will then be visually examined by trained personnel. This technology will significantly reduce the processing time for samples.

Any other APHIS approved laboratories will probably use grain inspection machines (Figure D-2 of Appendix D of the Karnal Bunt Manual) and visual examinations by trained personnel to analyze samples for bunted kernels.

### **Sample processing centers: Bunted Kernel Analysis**

A sample processing center is located in Olney, Texas. Samples will be processed as they arrive and the results provided to the submitting state.

Those states preferring to perform the analysis on their own samples are welcome to do so; the standard for sample analysis will be the bunted kernel examination, although spore analysis is approved as a screening procedure only. All facilities must be approved by APHIS prior to analyzing Karnal bunt samples.

### **Reporting:**

**Sampling plan reporting:** Prior to the survey season, each Regional Coordinator should provide the Karnal Bunt Headquarters staff with the following information:

1. A list of states participating in the survey and those not participating
2. The location where each state plans to have their sample analysis done
3. The number of proposed samples by state
4. The estimated date to begin sampling
5. The estimated date sampling will be completed
6. The number of counties in each state participating in the survey
7. KB Coordinator for each state including email and contact telephone numbers
8. Preference of NAPIS data entry by Olney National Survey Lab or by State themselves

### Results reporting:

A. **Negative Samples** – The laboratory conducting the sample analysis will report negative sample findings to the State Karnal Bunt Coordinator of the submitting state. The report will be forwarded at the end of each week via e-mail or FAX to the State Karnal Bunt Coordinator with a copy sent by FAX to Headquarters (301-734-8584). Once the State Karnal Bunt Coordinator notifies the laboratory conducting the analysis that the harvest season for the state is complete, the laboratory will issue a summary report for that state within 10 days of the last samples received for analysis. A copy of this report will also be sent by FAX to Headquarters at the above listed phone number.

The SPHD will provide the testing results to the State Survey Coordinator or data entry person for entry into NAPIS. The State survey CAPS coordinator may enter their own data into NAPIS or allow the Olney lab to forward the results to NAPIS. However, this must be decided and communicated prior to harvest season.

**B. Suspect Positive Samples** – The laboratory prepares the bunted kernel specimen and appropriate microscope slide with teliospores and sends them by overnight courier to the PPQ National Identifier (Dr. Mary Palm) or to personnel designated by the National Identifier. The specimen should include a copy of the original *National Karnal Bunt Wheat Grain Survey – 2005* form (See Appendix B) which was submitted with the original grain sample and the phone number of the State Plant Health Director.

Slides should be packed carefully in small cardboard boxes so they do not break during shipping and handling and sent by overnight mail. The package should be labeled “urgent” and “fragile.”

The Project Director in Olney, TX (or in the case of states analyzing their own samples, the State Plant Regulatory Official, SPRO) notifies the submitter, the State Plant Health Director (SPHD) from the state where the sample originated, the National Identifier, and the Karnal Bunt Senior Program Manager (Matt Royer 301-252-9452 or 410-798-9042) in Riverdale, MD that a suspect bunted kernel is being sent for confirmation.

The National Identifier notifies the Karnal Bunt Senior Program Manager, the Project Director in Olney (or in the case of states analyzing their own samples, the State Plant Regulatory Official, SPRO), and the SPHD in the state that submitted the sample to advise them that the sample is positive or negative for *Tilletia indica*. The SPHD will provide the testing results to the State Survey Coordinator or data entry person for entry into NAPIS.

**See Appendix C for detailed time line for submitting suspect positive specimen(s).**

**Primary Contacts:**

Matt Royer  
Acting Senior Program Advisor  
USDA, APHIS, PPQ  
4700 River Road Unit 98  
Riverdale, MD 20737  
Office- (301) 734-3769  
Cell- (240) 731-0598  
Fax- (301) 734-8724  
matthew.h.royer@aphis.usda.gov

Dr. Mary Palm  
USDA, APHIS, PPQ  
BARC-West  
Building 011A, Room 304  
10300 Baltimore Boulevard  
Beltsville, MD 20705  
Office - (301) 504-5327  
FAX - (301) 504- 5810  
mary.palm@aphis.usda.gov

**Regional Coordinators:**

**Eastern Region**  
Mary Mahaffey  
USDA, APHIS, PPQ  
920 Main Campus Drive, Suite 200  
Raleigh, NC 27606-5213  
(919) 855-7297 phone  
(919) 855-7391 fax  
mary.e.mahaffey@aphis.usda.gov

**Western Region**  
Phillip Mason  
USDA, APHIS, PPQ  
2150 Centre Avenue  
Building B Mailstop 3E10  
Ft. Collins, CO 80526  
(970) 494-7561 voice  
(970) 494-7501 fax  
phillip.a.mason@aphis.usda.gov

## Appendices

**Appendix A - State Karnal Bunt Survey Coordinators**

**Appendix B - Sample Information Form**

**Appendix C - Confirmation and Response Timeline**

**Appendix D - Data Entry into NAPIS**

**Appendix E - Bunted Kernel Analysis Centers**

*(This information will be provided as approved laboratories, other than the Olney, TX facility, are listed by APHIS)*

### Appendix A - State Karnal Bunt Survey Coordinators

NAME	Telephone
STATE ADDRESS	FAX
-----	E-mail (FTS)
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AL William H. Moore Jr. USDA APHIS PPQ 1836 Glynwood Dr Prattville, AL 36066	(334) 358-8568 (334)358-9490 william.h.moore@aphis.usda.gov
AR Thomas E. Hill USDA APHIS PPQ 1200 Cherry Brook Drive, Suite 100 Little Rock, AR 72211	(501) 324-5258 (501) 324-5230 thomas.e.hill@aphis.usda.gov
AZ Gary Russell USDA APHIS PPQ 3658 Chipman Road Phoenix, AZ 85040	(602) 431-8930 ext 205 (602) 438-0877 gary.russell@aphis.usda.gov
CA Danny Hamon USDA APHIS PPQ	(916) 930-5530 (916) 930-5539

	650 Capitol Mall suite 6-200 Sacramento, CA 95814	danny.j.hamon@aphis.usda.gov
	Cliff Ramos CDFA, Plant Pest Detection 1220 N. Street, Suite A-330 Sacramento, CA 95814	(916) 654-1211 (916) 654-0555 cramos@cdfa.ca.gov
CO	Patrick W. McPherren USDA APHIS PPQ 3950 N. Lewiston, Suite 330 Aurora, CO 80011-1555	(303) 371-3355 (303) 371-4774 patrick.w.mcpferren@aphis.usda.gov
CT	John O. Haanstad USDA APHIS PPQ 900 Northrop Road, Suite C Wallingford, CT 06492	(203) 269-4277 (203) 284-9031 john.o.haanstad@aphis.usda.gov
DE	Colleen Kitzmiller USDA APHIS PPQ 300 S. New Street, Suite. 1107 Dover, DE 19904	(302) 678-5868 (302) 734-7814 colleen.kitzmiller@aphis.usda.gov
FL	Tim Schubert FDACS/DPI P.O. Box 147100 Gainesville, FL 32614-7100	(352) 372-3505 X 143 (352) 372-0737 schubet@doacs.state.fl.us
GA	Robert Grant USDA APHIS PPQ 5645 Riggins Mill Road Dry Branch, GA 31020	(478) 752-1734 (478) 752-1734 robert.d.grant@aphis.usda.gov
IA	Mark Hollister USDA APHIS PPQ 6000 Fleur Drive Des Moines International Airport Des Moines, IA 50321-2871	(515) 285-7044 (515) 285-7524 mark.g.hollister@aphis.usda.gov
ID	Ben Simko Pest Survey and Detection Programs Idaho State Department of Agriculture Plant Industries Division 2270 Old Penitentiary Road P.O. Box 790 Boise, ID 83701	(208) 334-8627 (208) 334-2283 bsimko@.agri.state.id.us

	Liz Vavrika Idaho State Department of Agriculture 2270 Old Penitentiary Road P.O. Box 790 Boise, ID 83701	(208) 334-8620 (208) 334-2283 lvavrik@agri.state.id.us
IL	Laura Ettema Khan USDA APHIS PPQ 1817 South Neil Street Illinois Plaza, Suite 105 Champaign, IL 61820	(217) 398-1698 office Phone (217) 417-4355 Cell phone laura.ettema-khan@aphis.usda.gov
	Mark Cinnamon Illinois Department of Agriculture 9511 Harrison, Room A169 CMS North Suburban Des Plaines, IL 60018	(847) 294-4343 (847) 294-4350 mark.cinnamon@illinois.gov
IN	Gary Simon USDA APHIS PPQ 120 Professional Court, Suite D Lafayette, IN 47905	(765) 446-0267 (765) 446-8274 gary.w.simon@aphis.usda.gov
KS	Bill Scott Plant Protection and Weed Control Program Kansas Department of Agriculture P.O. Box 19282 Topeka, KS 66619-0282	(785) 862-2180 (785) 862-2182 bscott@kda..state.ks.us
KY	Victor Johnson USDA APHIS PPQ 3320 Springcrest Dr. Louisville, KY 40241	(502) 429-3936  victor.johnson@aphis.usda.gov
LA	W.E. Spitzer (SPHD) USDA APHIS PPQ 4354 S. Sherwood Forest Blvd. Room 150 Baton Rouge, LA 70816	(225) 298-5410 (225) 298-5415 william.e.spitzer@aphis.usda.gov
	Tad Hardy Louisiana Department of Agriculture & Forestry P.O. Box 3596	(225) 952-8100 (225) 925-3760 tad_h@ldaf.state.la.us

Baton Rouge, LA 70821-3596

MA	Michael Swett USAD APHIS PPQ Tip O'Neil Federal Building 10 Causeway Street, Room 518 Boston, MA 02222-1088	(617) 565-7030 (617) 565-6933 mike.swett@aphis.usda.gov
ME	Andrew R. Wilds USDA APHIS PPQ 15 Iron Road, Suite 1 Hermon, ME 04401	(207) 848-5199 (207) 848-2537 andrew.r.wilds@aphis.usda.gov
MD	C. Fredric Mann USDA APHIS PPQ 50 Harry S. Truman Parkway, Room 350 Annapolis, MD 21401	(410) 224-3452 (410) 224-1142 cfredric.mann@aphis.usda.gov
MI	David McKay USDA APHIS PPQ 11200 Metro Airport Center Dr. #140 Romulus, MI 48174	(734) 942-9005 (734) 942-7691 david.r.mckay@aphis.usda.gov
MN	Kevin Connors USDA APHIS PPQ P.O. Box 18 St. Paul, MN 55111	(612) 725-1722 (612) 725-1723 <u>kevin.j.connors@aphis.usda.gov</u>
	Geir Friisoe Minnesota Dept of Agriculture	(651) 201-6174
MO	Mike Brown State Entomologist Missouri Department of Agriculture P.O. Box 630 Jefferson City, MO 65102	(573) 751-5505 (573) 751-0005 Michael.Brown@mda.mo.gov
MS	Jeff Head USDA APHIS PPQ Mail Stop 9655 Mississippi State, MS 39762	(662) 325-3140 (662) 325-8955 jeffery.l.head@aphis.usda.gov
MT	Kimberly Merenz Pest Management Supervisor/CAPS Agricultural Sciences Division Montana Department of Agriculture	(406) 444-5427 Fax: 444-7336 kmerenz@mt.gov

P.O. Box 200201  
Helena, MT 59620-0201

Gary D. Adams  
USDA APHIS PPQ  
1220 Cole Avenue  
Helena, MT 59601

(406) 449-5210  
(406) 449-5212  
[gary.d.adams@aphis.usda.gov](mailto:gary.d.adams@aphis.usda.gov)

NC Patsy Waszak  
USDA APHIS PPQ  
930 Main Campus Dr.  
Suite 200  
Raleigh, NC 27606

(919) 855-7603  
(919) 855-0317  
[patricia.a.waszak@aphis.usda.gov](mailto:patricia.a.waszak@aphis.usda.gov)

ND David R. Nelson  
State Entomologist  
North Dakota Agricultural Department  
600 East Boulevard, 14th Floor  
Bismarck, ND 58505-0020

(701) 328-4765  
(701) 328-2240  
[danelson@state.nd.us](mailto:danelson@state.nd.us)

NE Timothy P. Miller  
Plant Health Safeguarding Specialist  
Dept. of Agriculture  
P.O. Box 94947 Lincoln, NE 68509

(402) 471-3252

[Timothy.P.Miller@aphis.usda.gov](mailto:Timothy.P.Miller@aphis.usda.gov)

NJ Richard R. Fine  
USDA, APHIS, PPQ  
325 Corporate Boulevard  
Robbinsville NJ 08691

Office: 609 259-7086  
cell phone: 609 377-1402  
Nextel Direct: 168\*1350\*18  
[richard.r.fine@aphis.usda.gov](mailto:richard.r.fine@aphis.usda.gov)

NH John Weaver  
Department of Agriculture, Markets  
and Food  
Division of Plant Industry  
29 Hazen Drive, Lab D  
Concord, NH 03301

(603) 271-7384  
(603) 271-3692

NM Stephen Vesper  
USDA APHIS PPQ  
6200 Jefferson St., NE# 130  
Albuquerque, NM 87109-3434

(505) 761-3192  
(505) 761-3197  
[stephen.g.vesper@aphis.usda.gov](mailto:stephen.g.vesper@aphis.usda.gov)

NV Shouhua Wang Plant Pathologist  
Nevada Department of Agriculture

(775) 688-1182 X 246  
(775) 688-1178

	350 Capitol Hill Avenue Reno, NV 89502	shwang@govmail.state.nv.us
NY	Dan Kepich USDA APHIS PPQ 8237 Kanona Road Avoca, NY 14809	(607) 566-2212 (607) 566-2081 daniel.j.kepich@aphis.usda.gov
OH	John Burch USDA APHIS PPQ 155 E. Columbus St. Suite 220 Pickerington, OH 43147	(614) 834-4625 (614) 834-4637 john.m.burch@aphis.usda.gov
OK	Blaine Powell USDA APHIS PPQ 301 NW 6th Street, Suite 101 Oklahoma City, OK 73102	(405) 609-8840 (405) 609-8841 blaine.powell@aphis.usda.gov
	Jeanetta Cooper Program Administrator Oklahoma Dept. of Agriculture, PICS 2800 N. Lincoln Blvd. Oklahoma City, OK 73105-4298	(405) 522-5971 (405) 522-4584 <u><a href="mailto:jcooper@oda.state.ok.us">jcooper@oda.state.ok.us</a></u>
OR	Nancy Osterbauer Oregon Department of Agriculture Plant Health Section 635 Capitol St. NE Salem, OR 97301-2532	(503) 986-4664  nosterba@oda.state.or.us
PA	Nancy S. H. Richwine Pennsylvania Department of Agriculture Bureau of Plant Industry 2301 N. Cameron Street Harrisburg, PA 17110-9408	(717) 772-5223  nrichwine@state.pa.us
RI	Patricia M. Douglass USDA APHIS PPQ 900 Northrop Road, Suite C Wallingford, CT 06492	(203) 269-4277 (203) 284-9031 patricia.m.douglass@aphis.usda.gov
SC	Sandy Friedman USDA APHIS PPQ 9600 Two Notch Road Suite 10 Columbia, SC 29233	(803) 788-2114 (803) 788-7940 sandra.l.friedman@aphis.usda.gov

SD	Dale Anderson South Dakota Department of Agriculture 523 E. Capital Ave Pierre, SD 57501	(605) 773-6389 (605) 773-3481 <a href="mailto:dale.anderson@state.sd.us">dale.anderson@state.sd.us</a>
TN	Jim Dattilo USDA APHIS PPQ 322 Knapp Blvd., Suite S-101 <a href="mailto:jim.dattilo@aphis.usda.gov">jim.dattilo@aphis.usda.gov</a> Nashville, TN 37217	(615) 781-5476 (615) 399-3026
TX	George Nash USDA APHIS PPQ 903 San Jacinto Blvd. Suite 270 Austin, TX 78701-2450	(512) 916-5241 (512) 916-5243 <a href="mailto:george.h.nash@aphis.usda.gov">george.h.nash@aphis.usda.gov</a>
UT	Gregory C. Abbott USDA APHIS PPQ 65 So. 100 E, Suite 212 Richfield, UT 84701	(435) 896-4772 (435) 896-8164 <a href="mailto:gregory.c.abbott@aphis.usda.gov">gregory.c.abbott@aphis.usda.gov</a>
VA	Debra D. Martin CAPS/Invasive Species Coordinator Office of Plant and Pest Services VA Dept. of Agriculture and Consumer Services 102 Governer Street, Rm LL55 Richmond, VA 23219	(804) 786-3515 (804) 371-7793 <a href="mailto:dmartin@vdacs.virginia.gov">dmartin@vdacs.virginia.gov</a>
VT	Mark Michaelis USDA APHIS PPQ 617 Comstock Road, Suite 3 Berlin, VT 05602	(802) 828-4490 (802) 828-4591 <a href="mailto:mark.j.michaelis@aphis.usda.gov">mark.j.michaelis@aphis.usda.gov</a>
WA	Clinton Campbell USDA APHIS PPQ Suite B Olympia, WA 98505-5715	(360) 753-9430 (360) 753-9585  <a href="mailto:clinton.l.campbell@aphis.usda.gov">clinton.l.campbell@aphis.usda.gov</a>
WI	Joann Cruse USDA APHIS PPQ One Gifford Pinochet Dr. Blg 1, Rm 204 Madison, WI 53705	(608) 231-9545 (608) 231-9581 <a href="mailto:joann.m.cruse@aphis.usda.gov">joann.m.cruse@aphis.usda.gov</a>
WV	Wes Drosselmeyer	(304) 229-3517

USDA APHIS PPQ  
P.O. Box 66  
Inwood, WV 25428

(304) 229-0836  
wesley.l.drosselmeyer@aphis.usda.gov

WY Larry T. Cain  
USDA APHIS PPQ  
5353 Yellowstone Road, Suite 208  
Cheyenne, WY 82009

(307) 432-7979  
(307) 432-7970  
larry.t.cain.@aphis.usda.gov

Sample Information Form

**Appendix B**

<b>NATIONAL KARNAL BUNT WHEAT GRAIN SURVEY</b>	
STATE	Survey Year:
NAME OF FACILITY WHERE SAMPLE WAS TAKEN	
CITY AND STATE OF FACILITY	
PRODUCTION COUNTY AND STATE	
TYPE OF GRAIN (HARD RED WINTER, DURUM WHEAT, TRITICALE, SOFT WHITE WINTER, ETC...)Please Specify	
DATE SAMPLE WAS TAKEN	
SAMPLE TAKEN FROM (GRAIN ELEVATOR, TRUCK, MILL, RESEARCH, FARM STORAGE, RAIL CAR)	
NAME, AND TELEPHONE # OF PERSON TAKING SAMPLE	
AGENCY OF PERSON TAKING SAMPLE (FEDERAL, STATE, UNIVERSITY)	
STATE SURVEY SAMPLE IDENTIFICATION NUMBER (EXAMPLE TX -100)	

Each State Karnal Bunt Survey Coordinator should establish and assign State Survey Sample Identification numbers for their state. The sample number will consist of the two letter state abbreviation plus a sequential three digit number beginning with 100 (i.e. TX-100).

Original form should be completed on site as sample is taken. When possible, a copy should be left with the elevator operator. Additional copies should be made for the State Plant Health Director's file and a copy for the State Plant Regulatory Official. The original form should be forwarded with the sample.

## **Confirmation and Response Timeline**

## **Appendix C**

The purpose of this Appendix is to provide a timeline for the confirmation process and response when Karnal bunt is confirmed from samples found during the National Karnal Bunt Survey.

The National KB Survey collects composite samples of wheat grain at country elevators throughout the United States. Four pound samples are drawn at each location participating in the National Survey. The samples, with proper labeling and documentation, are sent by overnight courier service as 4 pound samples to the National Karnal Bunt Survey analysis laboratory in Olney, Texas. States wishing to analyze their own samples may do so but must request APHIS to approve the facility.

The following procedure is to be followed in the event a suspect bunted kernel is found in a National Survey sample. Because of the ramifications of a positive National Survey detection from these samples, normal identification authority can be used as a tentative identification in determining a positive find, but no action will be taken without final verification from the National Identifier (Plant Pathology, i.e., Mary Palm or person designated by the National Identifier).

The following are not sequential, but concurrent actions by day:

### **Day 1: The National Survey analysis laboratory detects a bunted kernel suspected to be *Tilletia indica***

- A. Sample analyzed for bunted kernels and a suspect positive is found.
- B. The laboratory prepares the bunted kernel specimen and appropriate microscope slide with teliospores and sends them by overnight courier to the PPQ National Identifier (Dr. Mary Palm) or to personnel designated by the National Identifier. Included with the specimen is a copy of the original

National Karnal Bunt Wheat Grain Survey – 2005 form (See Appendix B) which was submitted with the original grain sample and phone number of the State Plant Health Director.

Slides should be packed carefully in small cardboard boxes so they do not break during shipping and handling and sent by overnight mail. The package should be labeled “urgent” and “fragile.”

***(If the event occurs on Friday, arrangements will be made to deliver the slides to the National Identifier or personnel authorized by the National Identifier for confirmation on Saturday. The National Identifier or other personnel authorized by the National Identifier will be notified by Karnal Bunt Senior Program Manager or other authorized person and overtime for the National Identifier will be authorized under the Karnal bunt accounting code to perform weekend identification.)***

- C. The Project Director in Olney, TX (or in the case of states analyzing their own samples, the State Plant Regulatory Official, SPRO) notifies the submitter, the State Plant Health Director (SPHD) from the state where the sample originated, the National Identifier, and the Karnal Bunt Senior Program Manager in Riverdale, MD (Matt Royer) that a suspect bunted kernel is being sent for verification.
- D. The Karnal Bunt Senior Program Manager notifies the Assistant Deputy Administrator of Pest Detection and Management Programs, the National Survey Coordinator, the Deputy Administrator, the Undersecretary MRP, Legislative and Public Affairs (LPA), and APHIS Emergency Programs Administrative Support of the suspect find.
- E. The SPHD in the originating state notifies the Regional representative and the State Plant Health Regulatory Official (SPRO) in that state.
- F. The Regional representative will alert Rapid Response Team (RRT) members to stand by for possible deployment to the area of the tentative detection.

**Day 2: National Identifier receives sample and makes determination:**

- A. The National Identifier notifies the Karnal Bunt Senior Program Manager, the Project Director in Olney (or in the case of states analyzing their own samples, the State Plant Regulatory Official, SPRO), and the SPHD in the state that submitted the sample to advise them that the sample is positive or negative for *Tilletia indica*. (If negative, call off the RRT alert).
- B. If the determination is positive, the Karnal Bunt Senior Program Manager notifies the Assistant Deputy Administrator of PDMP, the National Survey Coordinator,

the Deputy Administrator, the Undersecretary MRP, APHIS Emergency Programs Administrative Support, Investigative and Enforcement Services (IES), Legislative and Public Affairs (LPA), President of the National Plant Board, and NASDA contact of the positive find as a result of the National Survey.

- C. If the detection is in a new state, the previously prepared Decision Memorandum to the Secretary requesting a Declaration of Extraordinary Emergency is expedited by the PDMP Staff.
- D. SPHD notifies the Region and the SPRO in the origin state and requests a minimum of two PPQ Officers (from within state or RRT) and the area's IES Investigator to arrange travel to affected elevator.
- E. The SPHD or his designee and state cooperators travel to the facility in preparation to evaluate the status of grain represented by the sample and issue an Emergency Action Notice if appropriate.

**Day 3: Initial contact with facility and confirmation notifications**

- A. An investigation begins to determine extent of infection in elevator or site and initiation of the trace forward and trace back investigation.
- B. A State Plant Regulatory Official (SPRO) letter is electronically communicated to the states and President of National Association of State Departments of Agriculture (NASDA) with pertinent information
- C. The staff PDMP will schedule a conference call with NASDA, the President of NPB (and designees), and appropriate Federal agencies, states and industry to provide status of situation.
- D. First RRT appropriate local PPQ personnel and/or RRT report for duty to SPHD.

Regional plans for implementing a program must be prepared in advance of detecting KB. It is understood that the SPHD, should an outbreak occur in their state, will be responsible for the day-to-day operations of the program onsite for the season. An alternative is for a Regional Director designee to assume management of the day-to-day activities onsite for the season. The need for fulltime dedication of a manager is to ensure program continuity and decision making.

In advance of the next crop year Regional offices should develop a schedule (May-September) of personnel by name for TDY assignment to the program location. This roster will serve as the core for rotating personnel through the program.

**Day 4: Additional local PPQ personnel and/or RRT report for duty to SPHD.**

**Data Entry into NAPIS**

**Appendix E**

**Data can be entered into NAPIS by the following:**

- 1) The National Survey Lab in Olney, TX-primarily where samples are processed.
- 2) States that choose to process their own samples.
- 3) States that submit samples to Olney for analysis but prefer to enter their own data.  
The data will be forwarded to the state from the Olney National Survey Lab.

**Type of data entered:**

- 1) Four pound samples that represent a selected county with 1,000,000 bushels of production or more. (A 4lb sample should be taken for every 1,000,000 bushels of production.)
- 2) Four pound samples that represent several counties which have a combined total of 1,000,000 bushels of production or more. This is only done if each individual county has less than 1,000,000 bushels of production.

**How to enter data:** Samples should be entered based on county. For example:

Three samples are processed for a state (ST). Three possible scenarios are:

A) Sample ST100 was drawn from one county in **one** location therefore it is entered once.

B) Sample ST101 was drawn from one county with **several** locations. This sample is a composite however it should be entered once. It is drawn in accordance with National Survey protocol.

C) Sample ST102 was drawn from four counties from several locations. This sample would be entered four times under each individual county. This is done so that each county receives credit for participating. *In an instance where wheat is harvested in one state and stored in another, the county where the wheat was harvest is entered. If grain from one state is stored at an elevator in a neighboring state, then data entered will be for the state of origin. Indicate in the remarks section that each sample entry represents a composite with entries for the counties, and indicate their names.*

Any questions should be referred to:

Jim Pheasant: tel: (765) 494-9853

e-mail: pheasant@purdue.edu